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IN THE CLAIMS:

1   1. (Previously Presented) A programmable alarm clock system for waking a sleeper
2   during a selected period of sleep, said programmable alarm clock system comprising:
3   a sleep analyzing server;
4   at least one sleep activity sensor attachable to a head of a sleeper;
5   a receiver receiving sleep activity signals from at least one said sleep activity
6   sensor;
7   a local computer receiving a wake up time and received said sleep activity
8   signals and sending said received sleep activity signals remotely to said sleep analyzing
9   server; and
10   a remotely triggered local alarm device sounding a wake up alarm responsive to
11   a determination from said local computer that said sleeper should be awoken.

1   2. (Original) A programmable alarm clock system as in claim 1, wherein said sleep
2   activity is brain activity and said sleep analyzing server analyzes received brain activity
3   signals and identifies periods of slow wave sleep.

1   3. (Original) A programmable alarm clock system as in claim 1, wherein said sleep
2   activity is brain activity and said sleep analyzing server analyzes received brain activity
3   signals and identifies periods of REM sleep and non-REM sleep.

1   4. (Original) A programmable alarm clock system as in claim 1, wherein said at least
2   one sensor measures brain activity using electroencephelography.

1   5. (Original) A programmable alarm clock system as in claim 1, wherein said at least
2   one sensor measures brain activity using polysomnography.
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1   6. (Previously Presented) A programmable alarm clock system as in claim 1, wherein
2   said at least one sensor is a plurality of sensors measuring brain activity and in wireless
3   communication with said local computer.

1   7. (Previously Presented) A programmable alarm clock system as in claim 1, wherein
2   said at least one sleep activity sensor is one or more eyelid sensors are attached to said
3   sleeper's eyelids measuring said eye movement, said receiver receiving sensor signals
4   from said eyelid sensors.

1   8. (Previously Presented) A programmable alarm clock system as in claim 1, wherein
2   said local computer is further provided with a selected sleep activity, the sleep
3   analyzing server sending information about identified periods of said selected sleep
4   activity to said local computer and said local computer determines from received said
5   information when to trigger said wake up alarm relative to said wake up time.

1   9. (Previously Presented) A programmable alarm clock system as in claim 8, wherein
2   when said local computer determines that said sleeper is in an identified period of said
3   selected sleep activity at said wake up time, said local computer triggers said wake up
4   alarm.

1   10. (Previously Presented) A programmable alarm clock system as in claim 9, wherein
2   when said local computer determines that said sleeper is in an other sleep activity period
3   identified as having a sleep activity other than said selected sleep activity at said wake
4   up time, said local computer triggers said wake up alarm at an end to said other sleep
5   activity period.

1   11. (Previously Presented) A programmable alarm clock system as in claim 9, wherein
2   when said local computer determines that said sleeper is in an other sleep activity period

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3   identified as having a sleep activity other than said selected sleep activity at said wake

4   up time, said local computer postpones triggering said alarm until a next selected sleep

5   period.

1   12. (Previously Presented) A programmable alarm clock system as in claim 10, wherein

2   when said local computer determines that said sleeper is in an other sleep activity period

3   identified as having a sleep activity other than said selected sleep activity at said wake

4   up time, if said local computer determines that the next selected sleep activity period is

5   expected to occur beyond a selected margin, said local computer triggers said wake up

6   alarm.

1   13. (Original) A programmable alarm clock system as in claim 8, wherein said selected

2   sleep activity is REM sleep.

1   14. (Original) A programmable alarm clock system as in claim 8, wherein said selected

2   sleep activity is non-REM sleep.

1   15. (Previously Presented) A programmable alarm clock system as in claim 6, wherein

2   the server comprises:

3   a receiving module receiving sleep activity;

4   a signal analyzer charting sleep data and identifying sleep periods as being either

5   selected activity sleep periods or other activity sleep periods;

6   a signal labeler labeling selected activity sleep periods and other activity sleep

7   periods; and

8   a sender sending labeled said charts to the local computer.

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1   16. (Previously Presented) A programmable alarm clock system as in claim 15, further
2   comprising:
3   a signal processing unit receiving analog signals representative of said sleep
4   activity and providing digital sleep data to the signal analyzer responsive to said analog
5   signals.

1   17. (Previously Presented) A programmable alarm clock system as in claim 16, further
2   comprising:
3   one or more sleep activity sensors attached to the head of said sleeper, each of
4   said one or more sensors sending sleep activity signals to said receiving module.

1   18. (Previously Presented) A programmable alarm clock system as in claim 17, wherein
2   at least one of said one or more sleep activity sensors is sensing brain activity.

1   19. (Original) A programmable alarm clock system as in claim 18, wherein the signal
2   analyzer identifies sleep periods based upon selected brain activity prototypes.

1   20. (Previously Presented) A programmable alarm clock system as in claim 17, wherein
2   at least one of said one or more sense activity sensors senses eye movement.

1   21. (Currently Amended) A method of operating a programmable alarm clock, said
2   method comprising the steps of:
3   a)   receiving brain sleep activity signals and sending the brain activity
4   signals to a remotely connected server;
5   b)   digitizing said brain sleep activity signals;
6   c)   analyzing said digitized brain sleep activity signals to identify selected
7   sleep activity periods and other sleep activity periods;

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8   d)   waiting for a designated wake up time;

9   e)   determining whether said <u>brain</u> sleep activity signals indicate that a

10   sleeper is in a period of said selected sleep activity or a period of other sleep activity at

11   said designated wake up time; and

12   f)   sounding an alarm at said designated wake up time if said <u>brain</u> sleep

13   activity signals indicate said selected sleep activity.

1   22. (Currently Amended) A method of operating a programmable alarm clock as in

2   claim 21, when said <u>brain</u> sleep activity signals indicate said other sleep activity period

3   at said wake up time, said method further comprising the steps of:

4   g)   determining an alarm time to sound said alarm; and

5   h)   sounding said alarm at said alarm time.

1   23. (Previously Presented) A method of operating a programmable alarm clock as in

2   claim 22, wherein the determining step (g) comprises the steps of:

3   i)   determining whether a wait margin has been selected, the alarm time

4   being set to said designated wake up time when no wait margin has been selected;

5   ii)   setting the alarm time when said next expected selected sleep activity

6   period is within the wait margin; and

7   iii)   if said other sleep activity continues beyond said wait margin, setting

8   said alarm at the end of said wait margin.

24. (Cancelled).

1   25. (Currently Amended) A method of operating a programmable alarm clock as in

2   claim [[24]] <u>23</u>, wherein the analyzing step (c) comprises the steps of:

3   i)   creating a prototype chart of said digitized brain activity signals; and

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4   ii)   labeling periods in said prototype chart as being selected sleep activity

5   periods and other sleep activity periods.

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1   26. (Previously Presented) A method of operating a programmable alarm clock as in

2   claim 25, wherein said prototype chart is sent to a local computer.

1   27. (Previously Presented) A method of operating a programmable alarm clock as in

2   claim 26, wherein in the step (e) of determining whether sleep activity signals indicate

3   that the sleeper is in the selected sleep activity period, said local computer interrogates

4   the labeled prototype chart, determining therefrom whether the designated wake up time

5·   is in one of the selected sleep activity periods.

1   28. (Original) A method of operating a programmable alarm clock as in claim 27,

2   wherein the local computer sends a trigger to an alarm clock in the steps (f) and (h) of

3   sounding the alarm, the alarm clock sounding the alarm responsive to said trigger.

1   29. (Original) A method of operating a programmable alarm clock as in claim 28,

2   wherein the selected sleep activity is non-REM sleep.

1   30. (Original) A method of operating a programmable alarm clock as in claim 28,

2   wherein the selected sleep activity is REM sleep.

1   31. (Original) A method of operating a programmable alarm clock as in claim 28,

2   wherein the selected sleep activity is slow wave sleep.

1   32. (Previously Presented) A computer program product for operating a programmable

2   alarm clock system, said computer program product comprising a computer usable

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3   medium having computer readable program code thereon, said computer readable

4   program code comprising:

5   computer readable program code means for digitizing sleep activity signals;

6   computer readable program code means for analyzing digitized said sleep

7   activity signals to identify selected sleep periods and non-selected sleep periods;

8   computer readable program code means for determining whether to send a

9   trigger responsive to a designated wake up time is in a selected sleep period or non-

10   selected sleep period; and

11   computer readable program code means for sounding an alarm responsive to

12   said trigger.

1   33. (Previously Presented) A computer program product for operating a programmable

2   alarm clock system as in claim 32, wherein said computer readable program code means

3   for determining an alarm time comprises:

4   computer readable program code means for determining whether a wait margin

5   has been selected, a trigger time being set to said designated wake up time when no wait

6   margin has been selected;

7   computer readable program code means for setting said trigger time as a next

8   expected selected sleep activity period when said next expected selected sleep activity

9   period is determined to be expected to occur within the wait margin; and

10   computer readable program code means for setting said trigger time at the end of

11   said wait margin, when a non-selected sleep activity period is expected to extend

12   through said wait margin.

1   34. (Original) A computer program product for operating a programmable alarm clock

2   system as in claim 33, further comprising:

3   computer readable program code means for forwarding received sleep activity

4   signals to a remotely connected server.

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1   35. (Previously Presented) A computer program product for operating a programmable
2   alarm clock system as in claim 34, wherein the sleep activity signals are brain activity
3   signals and said computer readable program code means for analyzing digitized brain
4   activity comprises:
5   computer readable program code means for creating a prototype chart of said
6   digitized brain activity signals;
7   computer readable program code means for labeling periods in said prototype
8   chart as being selected sleep periods and non-selected periods; and
9   computer readable program code means for sending each labeled said prototype
10   chart to a local computer.

1   36. (Previously Presented) A computer program product for operating a programmable
2   alarm clock system as in claim 35, wherein said computer readable program code means
3   for sounding said alarm comprises:
4   computer readable program code means for causing said local computer to send
5   said trigger to a local alarm device.

1   37. (Previously Presented) A computer program product for operating a programmable
2   alarm clock system as in claim 34, wherein said sleep activity signals are indicated by
3   eye movement.

1   38. (Previously Presented) A computer program product for operating a programmable
2   alarm clock system as in claim 37, wherein said selected sleep activity is REM sleep.

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1   39. (Previously Presented) A computer program product for operating a programmable

2   alarm clock system as in claim 37, wherein said selected sleep activity is non-REM

3   sleep.

1   40. (Previously Presented) A computer program product for operating a programmable

2   alarm clock system as in claim 37, wherein said selected sleep activity is slow wave

3   sleep.

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